

REMARKS

Claims 1-33 were originally presented. After a restriction requirement and an election, claims 1-27 and 33 were examined in the Office Action. By this Amendment, claim 2 has been canceled, and claims 1 and 4 have been amended. Claims 1, 3-27 and 33 are therefore presented for reconsideration. Claims 28-32 – drawn to nonelected inventions – stand withdrawn from consideration.

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RESTRICTION REQUIREMENT

Applicants hereby confirm their telephone election of the invention of Group I (claims 1-27 and 33). Election is without traverse.

AMENDMENTS TO THE SPECIFICATION

Section headings in improper form have been replaced by proper section headings as suggested by the Examiner. Unnecessary section headings and other surplusage has been deleted from pages 20 and 26.

AMENDMENTS TO THE CLAIMS

In order to improve syntax, and for the sake of enhanced clarity, the phrase “to produce an acoustic output” has been moved from one part of claim 1 to another. The claim now recites that the vibration exciting system applies bending wave energy to the panel-form member “*to cause* the panel-form member to produce an acoustic output.” As this was inherent in the original wording, no change in scope results from this amendment.

The other change to claim 1 adds the “torsion” limitation from claim 2. Claim 1 now recites that the “vibration exciting system is adapted to apply *torsion* to the panel-form member.

Claim 2 has been deleted because it became redundant after inclusion of “torsion” in claim 1. The dependency of claim 4 has been changed accordingly.

In claim 4 the word “exciter” has been changed to “exciting system” so as to be consistent with parent claims 1 and 3.

CLAIM REJECTION UNDER 35 U.S.C. §112

Claim 4 is rejected because of a lack of antecedent basis for “the vibration exciter.” Office Action, ¶11. The above amendment to claim 4 rectifies this situation. The rejection should therefore be withdrawn.

CLAIM REJECTIONS: PRIOR ART

The following rejections have been made:

<u>O.A. ¶</u>	<u>Claims</u>	<u>Basis</u>	<u>Reference(s)</u>
12	1-13, 17-21, 24-27, 33	§102(b)	Kishi (US 4,654,554)
13	1-8, 10-13, 17-19, 24-27, 33	§102(e)	Azima (US 6,031,926)
14	1, 22	§102(b)	Danley (US 4,763,358)
15	1, 23	§102(b)	Seidel (US 4,885,781)
16	1	§102(f)	Azima '926
17	9, 20, 21	§103(a)	Azima '926 in view of Azima (US 6,151,402)
18	14-16	§103(a)	Azima '926 in view of Kumada (US 4,352,961)

These rejections are respectfully traversed in the context of the pending claims for at least the following reasons.

Kishi’s vibration exciting system is not adapted to apply torsion to a resonant panel-form member as specified in Applicants’ amended claim 1. Fig. 11 of Kishi, referred to in ¶12 of the Office Action, shows an acoustic radiator 30 provided with a piezoelectric vibrating element 10. There is no suggestion in Kishi that radiator 30 is a resonant member, or that element 10 imparts torsion to radiator 30.

Figs. 21(A), 21(B) of Kishi, also referred to in ¶12 of the Office Action, would appear to show a piezoelectric vibrating element suitable for use in the arrangement of Fig. 11, comprising a piezoelectric plate 101 applied to a thin metallic sheet 102 and provided with main and auxiliary weights 104, 108. The dashed lines in Fig. 21(A) depict unnecessary standing wave vibration which the weights 104, 108 serve to mitigate (see column 10, line 1 ff.). The actual motion generated by the vibrating element of Fig. 21(A) is, as indicated by arrows, perpendicular to the plane of the elements. There is no application of torsion as specified in amended claim 1. Accordingly, Kishi cannot anticipate any of the claims.

Azima '926 discloses several variants of a resonant panel-form loudspeaker. The embodiment of Fig. 1 (referred to in ¶13 of the Office Action) has a single transducer 9 of the type disclosed in Azima '402. See Azima '926 at column 2, line 66 through column 3, line 1, which references application No. 09/011,831 — the application that matured into Azima '402. Such a transducer imparts vibratory forces in a direction normal to the panel, i.e., it does not apply torsion to the panel-form member.

Also specifically referenced in ¶13 of the Office Action is Fig. 3 of Azima '926. However, in this embodiment there are two panel-form members 2, 4 — one suspended within the other — each having a single transducer 9 of the same type. As noted, such transducers do not apply torsion to the panels.

In the other Azima '926 embodiments referred to in ¶13 of the Office Action (Figs. 4-6) there are two transducers on a single panel, each transducer of the pair dedicated to a different frequency range. See, e.g., column 5, line 38 ff. of Azima '926. Specifically, one is a high-frequency transducer and the other is a low-frequency transducer, the two being driven by an amplifier to which they are connected in parallel via a frequency

dividing network. Such a network will tend to cause the high frequency transducer to be driven with a different set of signals as compared to the low frequency transducer. Such different signals will not work together to generate a torsion couple as illustrated, e.g., in Fig. 1 of the present application. Further, even if the input to Azima's loudspeaker is such that the signals supplied to the two transducers are similar, they will not be of the opposite polarity necessary to generate the oppositely directed forces required for a torsion couple of the type shown in Fig. 1 of the present application. Thus Azima does not disclose a vibration exciting system adapted to apply torsion to the panel-form member as specified in amended claim 1. Accordingly, Azima '926 cannot anticipate any of the claims.

Danley does not anticipate any of the claims because his "rotary sound transducer" does not have a resonant panel form member. Rather, Danley's items 27 (Fig. 2) and 52, 54 (Fig. 4) — referred to in ¶14 of the Office Action — are mere baffles. According to column 3, line 37ff. of Danley, a vane 16 alternately compresses and rarefies the air in the tube 10 on each side of the baffle, causing generation of sound. Nothing in Danley suggests that the baffles behave as resonant panel-form members.

Seidel discloses a microphone, not a loudspeaker as claimed by Applicants. See column 1, lines 40-42 of Seidel. Seidel's device has a clamped "membrane" 3 which vibrates in response to incident acoustic energy. Membrane 3 is not a resonant panel-form member. Accordingly, Seidel does not anticipate any of the claims.

The secondary rejections under 35 U.S.C. §103(a) cannot stand because neither secondary reference (Azima '402 or Kumada) supplies the basic element missing from the primary references: a vibration exciting system adapted to apply "torsion" to the panel-form member. Thus, even if the teachings of the references were combined as suggested by the Examiner, the result would not meet all of the limitations of the claims.

The rejection of claim 1 under 35 U.S.C. §102(f) is moot in light of the "torsion" amendment to claim 1. Applicants nevertheless reserve the right to contest the inventorship issue raised by this rejection.

DOUBLE PATENTING


Claim 1 has been provisionally rejected on the ground of obvious-type double patenting as "unpatentable over claim 1 of copending Application No. 08/707,012." Office Action, ¶20. This rejection is respectfully traversed. First, claim 1 of the '012 application is no longer pending, so it cannot be used as the basis of a double patenting rejection. Second, although all of the claims of the '012 application have been allowed, and the issue fee has been paid, there is no teaching in those claims or in any secondary teaching of a vibration exciting system that applies torsion to a panel-form member. Accordingly, the rejection cannot stand, and should be withdrawn.

CONCLUSION

For the foregoing reasons, the objection and rejections should be withdrawn, and all of the claims allowed. Favorable action is earnestly solicited.

Respectfully submitted,

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Date


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MARKED-UP VERSION SHOWING CHANGES MADE

IN THE SPECIFICATION:

Page 1, line 10: [DESCRIPTION] BACKGROUND

Page 1, line 15: [TECHNICAL FIELD] 1. Field of the Invention

Page 1, line 23: [BACKGROUND ART] 2. Description of the Related Art

Page 2, line 26: [DISCLOSURE OF INVENTION] SUMMARY OF THE INVENTION

Page 6, line 5: [BRIEF DESCRIPTION OF DRAWINGS]
BRIEF DESCRIPTION OF THE DRAWINGS

Page 8, line 23: [BEST MODES FOR CARRYING OUT THE INVENTION]
DETAILED DESCRIPTION OF THE INVENTION

Page 20, line 9: Deleted

Page 21, line 1: [CLAIMS] CLAIMS

Page 26, line 1: [ABSTRACT] ABSTRACT

Page 26, line 2: Deleted

Page 26, line 10: Deleted

IN THE CLAIMS:

1. (Twice Amended) A loudspeaker comprising a resonant panel-form member [adapted to produce an acoustic output] and a vibration exciting system on the panel-form member and adapted to apply bending wave energy thereto to cause the panel-form member to produce an acoustic output, wherein the vibration exciting system is adapted to apply [a bending couple] torsion to the panel-form member.

2. Deleted

4. (Twice Amended) A loudspeaker according to [claim 2 or] claim 3, wherein the vibration [exciter] exciting system is coupled to the panel-form member to span a plurality of nodal lines in the panel-form member.